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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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SHUMAKER & SIEFFERT, P. A.				
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WOODBURY, MN 55125				
EXAMINER				
KAHELIN, MICHAEL WILLIAM				
ART UNIT		PAPER NUMBER		
3762				
NOTIFICATION DATE		DELIVERY MODE		
03/30/2009		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

pairedocketing@ssiplaw.com

Office Action Summary

Application No.

10/693,012

Applicant(s)

TOY ET AL.

Examiner

MICHAEL KAHLIN

Art Unit

3762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 12-27, 29-43, 45-51 and 53-69 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12-27, 29-43, 45-51 and 53-69 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
3. Claims 1-10, 12-27, 29-43, 45-51, and 53-69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kotowski et al. (US 6,055,168, hereinafter "Kotowski") in view of Lebel. Kotowski discloses the essential features of the claimed invention including the following:
4. In regards to claims 1, 3, 10, 14, 16, 18, 20, 27, 31, 33, 35, 37, 43, 47, 49, 51, 55, 57, 59, 60, 62, and 64, Kotowski discloses a boost converter to convert a battery voltage to an operating voltage and a control circuit to inhibit pulse skipping by the boost converter when a level of the battery voltage is greater than a threshold voltage (col. 3,

line 19-col. 4, line 8). Since the input (battery) voltage is used to select the gain based on a number of thresholds (col. 3, lines 51-65), and the gain is used to inhibit pulse skipping, the disclosed pulse skipping is inhibited when a level of the battery voltage exceeds some arbitrary threshold voltage. Kotowski further discloses that pulse skipping is activated when the operating voltage exceeds a threshold and the boost converter is a fixed frequency switching mode boost converter (col. 3, line 30). Kotowski does not disclose that this voltage converter is used in a handheld programmer having an internal antenna in combination with a neurostimulator. Lebel teaches of a handheld programmer having an internal antenna in combination with a neurostimulator that utilizes a boost converter, such as the one disclosed by Kotowski, to efficiently provide the voltages needed to operate a device that is small and utilizes off-the-shelf batteries. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Kotowski's invention by providing the voltage converter to a handheld programmer having an internal antenna in combination with a neurostimulator that utilizes a boost converter to provide the predictable results of efficiently providing the voltages needed to operate a device that is small and utilizes off-the-shelf batteries.

5. In regards to claims 2, 19, and 36, the boost converter activates pulse skipping when the operating voltage exceeds a threshold (col. 3, line 30).
6. In regards to claim 4, 21, 38, 63, and 65, a transistor couples the battery to the boost converter (Fig. 5, element 10). Because the battery voltage enforces the

minimum gain, which is determined by the transistor-based switching of 10, Kotowski meets the claim language.

7. In regards to claims 13, 30, 46, and 54, pulse skipping is inhibited by limiting the level of the battery voltage applied to the boost converter (by switching per Fig. 5).

8. In regards to claims 5-9, 22-26, 39-42, and 61, Kotowski's modified invention including modifying the voltage supplied to the boost converter based on the battery voltage, but does not disclose a comparator to actuate the transistor, or that the transistor is a MOSFET/MOSFET pair that transmits the battery voltage less a body diode/resistor voltage/external diode drop to the boost converter. It is well known in the electronic arts to utilize comparators to determine when values exceed thresholds with common off-the-shelf parts and to utilize MOSFET/MOSFET pairs that transmit the battery voltage less a body diode/resistor voltage/external diode drop to provide reliable switching with common off-the-shelf parts. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify Kotowski's invention by providing a comparator to provide the predictable result of determining when the input value exceeds a threshold with common off-the-shelf parts and to utilize a MOSFET/MOSFET pair that transmits the battery voltage less a body diode/resistor voltage/external diode drop to provide the predictable result of providing reliable switching with common off-the-shelf parts.

9. In regards to claims 15, 32, 48, and 56, Kotowski discloses the essential features of the claimed invention including modifying the gain of the boost converter based on

the battery voltage (col. 3, line 60), but does not explicitly disclose utilizing two or more AA, AAA, C, or D batteries. However, it is well known in the art to provide portable devices with two or more AA, AAA, C, or D batteries to power various devices with readily available power sources. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify Kotowski's invention by providing the device with two or more AA, AAA, C, or D batteries to provide the predictable result of powering various devices with readily available power sources. In regards to claims 12, 17, 29, 34, 45, 50, 53, and 58, Kotowski's modified invention discloses the claimed invention but does not disclose expressly the claimed voltage ranges. It would have been an obvious matter of design choice to a person of ordinary skill in the art to modify the voltage converter as taught by Kotowski with the claimed ranges because applicant has not disclosed that these ranges provide an advantage, are used for a particular purpose, or solve a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with the voltage converter as taught by Kotowski because both devices efficiently convert an input voltage to an output operational voltage. Therefore, it would have been an obvious matter of design choice to modify Kotowski's invention to obtain the invention as specified in the claims.

10. In regards to claims 66-69 Kotowski's modified invention discloses the claimed invention but does not disclose expressly the comparator that compares the level of the battery voltage to the threshold voltage. It would have been an obvious matter of design choice to a person of ordinary skill in the art to modify the comparator for

comparing the output voltage to a threshold as taught by Kotowski with the comparator for comparing the input voltage with a threshold because applicant has not disclosed that a comparator on the input provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with the comparator as taught by Kotowski because both configurations determine the suitability of a gain setting for pulse-skipping inhibition. Therefore, it would have been an obvious matter of design choice to modify Kotowski's invention to obtain the invention as specified in the claims.

Response to Arguments

11. Applicant's arguments filed 1/16/2009 have been fully considered but they are not persuasive. Applicant argued that Kotowski discloses that the input voltage is used to select a minimum gain, but does not disclose that any other gain settings, such as gain settings that are used to determine the output voltage, are selected based on the input voltage, and further argued that Kotowski fails to disclose that pulse skipping is inhibited based on a level of battery voltage. However, the claim language does not require pulse skipping inhibition "based on" a level of battery voltage or input voltage. The claim language recites that pulse skipping is inhibited "when a level of the battery voltage is greater than a threshold voltage." This language does not require that the gain be adjusted "directly in response to" or "based on" the battery/input voltage, but only that the pulse skipping is inhibited "when" a level of the battery voltage is greater than a threshold voltage. Nothing in claims 1, 18, 35, 51, 60, 62, and 64, require

sensing of the battery/input voltage, a threshold that is pre-programmed or preset, or anything to compare the battery/input voltage to the threshold.

12. Applicant further provided an example of an instance where Kotowski's modification of gain may not result in an inhibition of pulse skipping. See "Remarks," 1/16/2009 at p. 14. The claim language does not require that the system "inhibit pulse skipping by the boost converter when a level of the battery voltage is greater than a threshold voltage" in every conceivable instance, but only at some point in its operation. Even if Kotowski does not inhibit pulse skipping when the actual gain reaches the minimum gain, Kotowski does inhibit pulse skipping over the remaining ranges of gain values. Further, the plain meaning of the claim term "inhibit" does not require complete elimination of pulse skipping, but only a limitation or a decrease in the skipping.

13. Applicant further argued that Kotowski fails to disclose that the applied gain of the switched capacitor circuit is decreased when the battery voltage is greater than a threshold voltage, but merely describes that the gain is decreased when the output voltage exceeds the desired output voltage a threshold number of times. As indicated above, the claim language does not require measuring the battery/input voltage or utilizing a preset threshold. Kotowski discloses "inhibit[ing] pulse skipping" by modifying the gain "when a level of the battery voltage is greater than a threshold," the threshold being that level of battery voltage that causes the threshold number of "skips" to occur. When this threshold level is exceeded, the gain is adjusted. Even though Kotowski may directly measure an output voltage, this output voltage is based on the combination of

input voltage and gain, and thus the output voltage is high "when" the input voltage is high.

14. Applicant further argued that Kotowski discloses pulse skipping, not inhibiting pulse skipping. However, as discussed above and in the previous Office Action, the modification of the gain is "inhibit[ing] pulse skipping" because the newly adjusted gain results in fewer pulses being skipped.

15. Applicant further argued with respect to claims 60, 62, and 64 that Kotowski fails to disclose limiting the level of the battery voltage inputted into converter 300, and thus fails to disclose "limit[ing] a level of the battery voltage applied to the boost converter." However, these two phrases are not synonymous ("limiting the level of the battery voltage inputted into converter" and "limit[ing] a level of the battery voltage applied to the boost converter"). The claims mention nothing of the voltage "inputted" into the converter, but merely "applied to the boost converter." Any of the voltages used by the boost converter are "applied to" at least a portion of the converter. As such, the various voltages produced by manipulation of the gain -control switches of Figure 4 can reasonably be considered to "limit a level of the battery voltage applied to the boost converter."

16. In regards to claims 4, 21, 38, 63, and 65, Applicant argued that Kotowski fails to disclose a transistor that transmits battery voltage to the boost converter because the switched capacitor array is a component of the converter. However, as interpreted above, the battery voltage need only be applied to some portion of the converter, such as by transistor-based switches S1, S3, S5, S7, or S9.

Conclusion

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **MICHAEL KAHELIN** whose telephone number is (571)272-8688. The examiner can normally be reached on **M-F, 8-4**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Angela Sykes can be reached on (571) 272-4955. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael Kahelin/
Examiner, Art Unit 3762

/Angela D Sykes/
Supervisory Patent Examiner, Art Unit 3762